

## WHAT IS CLAIMED IS:

1. A method for rounding a first two's complement fixed point datum,  $X$ , having an integer part of  $n$  bits, a fractional part of  $a$  bits the integer part, and sign bit,  $s_i$ , to a second two's complement fixed point datum,  $\hat{X}$ , having a fractional part of  $b$  bits following the radix point, where  $a$  and  $b$  are representative of the respective precisions of  $X$  and  $\hat{X}$ , and where  $a > b$ , comprising:

10 a. evaluating the fractional part of  $X$  and defining  $y$  as the most significant bit (MSB) of the  $a$  bits;

b. if the first bit following the radix point of  $X$  is equal to a "1" bit trailed by  $(a-1)$  "0" bits, then defining  $\hat{X}$  substantially according to the equation:

15 
$$\hat{X} = n + s_i$$

and

otherwise, defining  $\hat{X}$  substantially according to the equation:

$$\hat{X} = n + y$$

20

2. The method of claim 1, wherein the occurrence of positive numbers and negative numbers in a plurality of the datum,  $X$ , is substantially equiprobable.

25 3. A computer program product recorded on a computer readable medium for rounding a first two's complement fixed point datum,  $X$ , having an integer part of  $n$  bits, a fractional part of  $a$  bits the integer part, and sign bit,  $s_i$ , to a second two's complement fixed point datum,  $\hat{X}$ , having a fractional part of  $b$  bits following the radix point, where  $a$  and  $b$  are representative of the respective precisions of  $X$  and  $\hat{X}$ , and where  $a > b$ , comprising:

30

a. computer readable program code which evaluates the fractional part of X and defining y as the most significant bit (MSB) of the a bits;

5 b. computer readable program code which, if the first bit following the radix point of X is equal to a "1" bit trailed by (a-1) "0" bits, then defines  $\hat{X}$  substantially according to the equation:

$$\hat{X} = n + s_i$$

and

10 computer readable program code which otherwise defines  $\hat{X}$  substantially according to the equation:

$$\hat{X} = n + y$$

4. The computer program product of Claim 3, wherein the  
15 occurrence of positive numbers and negative numbers in a plurality of the datum, X, is substantially equiprobable.